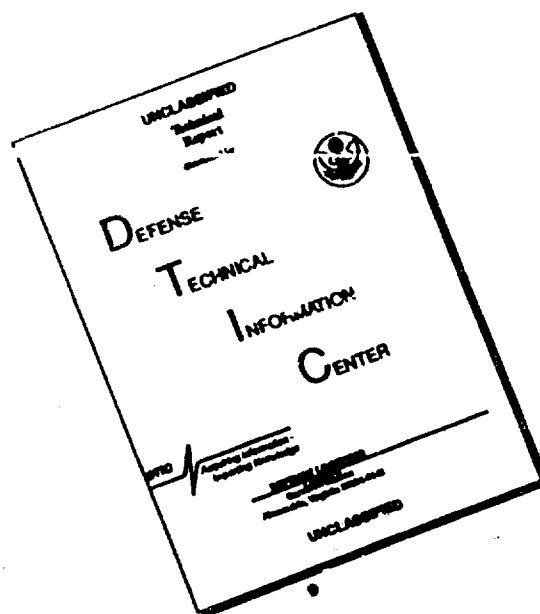


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REVISION OF A QUESTIONNAIRE TO MEASURE STRESS  
AND RELATED ASPECTS OF BASIC TRAINING<sup>1</sup>

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<sup>1</sup>Report Number 82-19, supported by the Naval Medical Research and Development Command, Department of the Navy, under research Work Unit M0096-PN.001-1035. The views presented in this paper are those of the authors. No endorsement by the Department of the Navy has been given or should be inferred.

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#### SUMMARY

At the request of the Marine Corps, an investigation of both the positive and negative effects of psychological stress in basic training was begun. As a first step, a questionnaire was developed to provide situation-specific measures of stress and related facets of this setting. Results from this initial questionnaire indicated that several scales measuring specific aspects of role demands and disciplinary styles experienced by the recruits were psychometrically unsatisfactory. Interviews with recruits during initial questionnaire development had indicated that these aspects of training were potentially critical determinants of recruits' reactions to their experiences. Inadequate measurement could, therefore, seriously impair efforts to meet program objectives and changes were made in these unsatisfactory scales in an effort to improve their measurement characteristics.

The revised questionnaire was given to a random sample of 425 recruits graduating in February and March, 1980. The revisions were successful, increasing the internal consistency for five of the seven initially marginal scales. Further analysis suggested that six distinct aspects of basic training should be considered in future studies to obtain a complete picture of recruit perceptions of their experiences. These were: (a) Discipline/Job Pressure which reflects performance expectations and pressures placed on the recruits, (b) Leader Support which represents the recruits' perception that the Drill Instructors care about recruits as potential Marines and provide a training environment which supports the recruits' efforts to complete training successfully, (c) Leader Admiration which indicates the extent to which recruits see Drill Instructors as experts and good examples to follow in becoming Marines, (d) Leader Structure/Role Clarity which represents the extent to which training procedures and expectations are clearly communicated by the Drill Instructors, (e) Challenge/Autonomy which reflects the perceived opportunities to develop and demonstrate skills and abilities and to assume responsibility during training, and (f) Group Teamwork/Group Support reflecting the ways the recruits within a platoon interact.

Composite scales developed from these factors can be used to reduce the number of variables included in future studies. Despite the many unique aspects of Marine Corps basic training, the general factors identified as necessary to describe it are very similar to those found for other organizational settings. This suggests that hypotheses developed in general organizational research can guide our further research on stress effects in Marine Corps basic training.

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## INTRODUCTION

Observers generally agree that military basic training is a stressful period for recruits (Maskin & Altman, 1943; Janis, 1945; Brotz & Wilson, 1956; Bourne, 1967; Zurcher, 1967; Faris, 1973). The effects of this stress are not clear-cut. Possible negative effects mentioned in previous reports include negative mood experienced by recruits during training (Datel, Engle & Barba, 1966; Biersner, La Rocco & Ryman, 1976) and recruit self-reports that these stresses contribute to attrition from training (Mobley, Hand, Baker & Meglino, 1978). On the other hand, major positive changes in recruit attitudes towards the Marine Corps have been reported early in training during the period of highest stress (Booth & Hoiberg, 1973). This change may be partly due to the stress of this initiation period (Aronson & Mills, 1959).

To date, little work has been done on describing the actual processes of change in recruit perceptions and attitudes during training or on indicating how specific stresses affect these processes to determine overall training outcomes. To better understand these issues, a research program was undertaken to investigate both the positive and negative effects of psychological stress in Marine Corps basic training. An essential step in this program was the development of a questionnaire to provide appropriate measures of stress and related facets of training.

The theoretical background, details of development, and initial evaluation of this questionnaire have been described elsewhere (Vickers & Ryman, 1980). The questionnaire attempted to measure 23 specific aspects of the training experience. These were categorized into three conceptual areas. One area involved role demands or stresses experienced by recruits during training. The second area, interpersonal processes, covered leadership styles of Drill Instructors and interactions between recruits. The third area was disciplinary style and other types of social influence employed by Drill Instructors to direct recruit behavior.

Analysis of responses to this initial questionnaire indicated that some revision would be necessary. Two specific problems were identified. One problem was that the internal consistency for several scales was lower than desired (Cronbach's  $\alpha < .65$ ). The questionable scales were primarily those related to role demands and disciplinary style. Improving these scales for use in later stages of the research was essential to provide a faithful representation of training as viewed by recruits (cf., Vickers & Ryman, 1980).

The second problem was that the number of basic dimensions required to accurately represent recruits' perceptions of training remained uncertain. Factor analysis of the scales from the initial questionnaire identified four basic dimensions: (a) Role demands on the recruit, (b) Role model characteristics of the Drill Instructors, (c) Leader structuring and clarity of role expectations, and (d) Group teamwork and support. However, because potentially critical scales were not included in this original factor analysis due to poor internal consistency, the number of basic factors may have been underestimated. Determining the number of basic dimensions present is important to the formulation of hypotheses for future research and if abbreviated questionnaires should become desirable.

### Questionnaire Revision

The primary goal of the questionnaire revisions was to improve the internal consistency of the marginal scales. This would permit a more accurate determination of the basic dimensions needed to describe recruit training experiences. These revisions took several forms.

1. Phase-Specific Questions. Recruit interviews indicated that they perceived basic training as divided into three general phases with training activities differing considerably across phases. The first consisted of the initial two weeks of basic training when the recruits are introduced to basic military skills. The second training phase consisted of two periods of two weeks each during which the recruits were taught to handle a rifle and basic field training. The third phase consisted of the final weeks of training during which the final activities associated with graduation were carried out. Since the initial questionnaire asked recruits to describe training based on their overall training experiences,

these interphase differences may have lead to inconsistent responses to different questions in a scale. Therefore, scales with relatively low internal consistency in the initial questionnaire were presented three times in the revised questionnaire. Each presentation focused on a specific phase of training.

2. Response Alternative Revision. The questionnaire items had been selected for pertinence to basic training based on recruit interviews (cf., Vickers & Ryan, 1980). It was thus probable that most recruits had experienced each stress measured at some time during their training. Therefore, the initial response format which asked recruits to select from alternatives ranging from "Disagree Strongly" (1) to "Agree Strongly" (7) that an event had occurred during their training could have produced a restriction of range for some items. In the revised questionnaire, recruits were asked to indicate the frequency of certain types of events with response alternatives ranging from "Never" (1) to "Always" (7).

3. Increased Item Specificity. Feedback from recruits indicated they sometimes found it difficult to respond to very general statements about training. Such items were replaced by more specific training references wherever possible.

4. Personalization of Items. To measure stress within individual platoons it was necessary to focus the recruits' attention on their own experiences in training rather than on general opinions about training. This was done by rewriting items into the first or second person, past tense.

5. New Scale. Recruits' comments suggested that responses to stresses depended on whether the stresses were seen as serving a valid function in training. A new scale, Purpose, was added to measure this qualifier of training experiences.

Due to the length introduced by these revisions, some scales which had shown satisfactory internal consistency were deleted for this study. Also, specific items which could be dropped from a scale without reducing its internal consistency were removed from the remaining scales. To ensure identification of the four factors from the initial study if they recurred, scales with factor loadings of at least .60 were retained in the revised questionnaire as marker variables. The resulting scales used in the revised questionnaire are given in Appendix A.

#### METHOD

##### Sample

Four hundred and thirty-three recruits were randomly selected from the rosters of 39 platoons completing training at the Marine Corps Recruit Depot, San Diego, during February and March, 1980. These recruits represented approximately a 20% sample. Of these, 425 completed the questionnaire.

##### Questionnaire Administration

The questionnaire was administered the day prior to their graduation to groups of approximately 44 recruits. After obtaining informed consent, the questionnaire was administered verbally to control the speed of completion of the test and avoid possible effects of reading difficulties. Recruits marked their responses on an optical scanning form using the 7-point scales described in the questionnaire revision procedures. Explanations of individual items were given when requested, and items which had been missed were repeated upon request.

##### Analysis Procedures

Half of the recruits from each platoon were assigned to each of two subsamples (n=212/213). Analyses were performed separately for each subsample using the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, et al., 1975).

Internal consistency estimates were computed for item composites. Scales which had an alpha of at least .50 for both subsamples, either initially or after the deletion of one or two items, were retained for analysis since this level had been recommended as adequate for exploratory use by Nunnally (1967). The internal consistencies for the initial and final item sets for each scale are given at the end of Appendix A.

Pearson correlations between the scales were computed. An orthogonal varimax factor analysis was carried out using a principal factors method with iteration and with squared multiple correlations as the initial communality estimates.

## RESULTS

Scale internal consistencies were improved by the phase-specific presentation format for 5 of 7 scales (see Table 1). The profile of scale means for the three phases was consistent with descriptions given by graduating recruits in preliminary study interviews.

TABLE 1  
COMPARISON OF INTERNAL CONSISTENCIES  
FOR INITIAL QUESTIONNAIRE SCALES  
WITH PHASE-SPECIFIC SCALES FROM REVISED QUESTIONNAIRE

SCALES	INTERNAL CONSISTENCIES FOR THE INITIAL QUESTIONNAIRE		PHASE OF TRAINING <sup>b</sup>	INTERNAL CONSISTENCIES FOR THE REVISED QUESTIONNAIRE		SCALE MEANS	
	1	2		1	2	1	2
Role Conflict	.63	.61	1	.74	.60	4.24	4.36
			2	.79	.75	3.75	3.84
			3	.78	.78	3.46	3.53
Overload	.57	.69	1	.70	.67	5.04	5.01
			2	.75	.69	4.55	4.47
			3	.81	.73	4.33	4.23
Challenge <sup>a</sup>	.42	.51	1	.19	.47	4.98	4.83
			2	.35	.45	5.40	5.36
			3	.46	.54	5.42	5.29
Autonomy	.39	.55	1	.61	.55	2.90	2.86
			2	.50	.55	3.50	3.45
			3	.51	.50	4.13	4.06
Rules Emphasis	.47	.52	1	.57	.50	5.95	6.00
			2	.71	.70	5.78	5.77
			3	.78	.74	5.44	5.41
Punishment Behavior	.62	.63	1	.70	.69	5.16	5.22
			2	.75	.73	5.03	4.99
			3	.74	.75	4.73	4.73
Performance Goals	.45	.46	1	.48	.48	6.39	6.44
			2	.60	.66	6.51	6.50
			3	.61	.66	6.63	6.63

<sup>a</sup>For purposes of comparison, the complete Challenge scale from the revised questionnaire is used rather than the two final subscales.

<sup>b</sup>Basic training was divided into three general phases; see page 3.

Recruit scores for each scale were correlated across training phases (average  $r = .56$ ; see Appendix B). Phase-specific measures were, therefore, combined into a single measure for each variable in Table 1 to provide an overall assessment of training for further analyses. This procedure reduced the risk of distorting the factor structure of training perceptions by including several correlated measures of a single variable. Descriptive statistics for the scales used in the factor analyses are presented in Table 2.

**TABLE 2**  
**DESCRIPTIVE STATISTICS FOR PERCEPTIONS OF TRAINING**

	MEAN		STANDARD DEVIATION	
	SAMPLES		SAMPLES	
	1	2	1	2
<b>ROLE DEMANDS</b>				
Role Clarity	5.71	5.81	0.82	0.85
Role Conflict <sup>a</sup>	3.81	3.90	1.30	1.11
Challenge-Effort <sup>a</sup>	5.88	5.72	0.82	0.81
Challenge-Skill <sup>a</sup>	4.57	4.56	1.07	1.05
Overload <sup>a</sup>	4.63	4.57	1.00	0.83
<b>INTERPERSONAL PROCESSES</b>				
Leader Support	5.15	5.12	1.27	1.28
Leader Structure	5.50	5.43	1.02	0.86
Group Support	3.95	3.90	1.16	1.09
Group Teamwork	4.82	4.47	1.27	1.25
Purpose	4.81	5.02	1.35	1.25
<b>DISCIPLINARY STYLE/MODES OF SOCIAL INFLUENCE</b>				
Autonomy <sup>a</sup>	3.72	3.63	0.90	0.88
Rules Emphasis <sup>a</sup>	5.80	5.79	0.83	0.82
Punishment Behavior <sup>a</sup>	4.97	4.88	1.10	1.10
Expert Power	6.82	6.51	0.61	0.73
Performance Goals <sup>a</sup>	6.51	6.53	0.80	0.53
Referent Power	5.80	5.80	1.04	0.97

<sup>a</sup>Scales averaged across three training phases.

NOTE: With the exception of Expert Power, Referent Power, and Performance Goals, the distributions of scale scores approximated normality with skewness and kurtosis values less than |.77|.

Correlations between perceptions of training are given in Table 3. The two subsamples in this study can be regarded as comparable, since significant differences between their correlations appeared with chance frequency. Several different factor solutions were considered. A 4-factor solution gave a direct comparison to Vickers and Ryman's (1980) earlier findings. A 5-factor solution resulted from rotating only factors with eigenvalues greater than 1.00. Finally, Cattell's scree test suggested a 6-factor solution (cf., Gorsuch, 1974, for a discussion of these criteria). Each solution produced highly stable factors. The minimum coefficient of congruence was .89 and the median was .97 for the three solutions (see Appendix C). There was no indication that the addition of a fifth and sixth factor capitalized on chance associations.

Figure 1 summarizes the 4- and 6-factor solutions and compares them to the findings from the initial questionnaire. The difference between the 5-factor solution (not shown in Figure 1) and the 6-factor solution was that the factors labelled 1-A and 1-B in Figure 1 combined in a single factor in the 5-factor solution. Factor matrices for the 4-, 5-, and 6-factor solutions are presented in Appendix D.

TABLE 3  
PEARSON CORRELATIONS AMONG SCALES INCLUDED IN THE FACTOR ANALYSIS

	GS	GT	EP	RP	P	LSp	LSr	RCI	A	CS	CE	O	PB	RCf	PG	RE
Group Support (GS)		.82	.11	.20	.22	.36	.17	.28	.18	.24	.18	-.06	-.08	-.11	.10	.16
Group Teamwork (GT)	.63		.29	.30	.18	.36	.29	.36	.28	.34	.18	-.01	-.11	-.08	.18	.08
Expert Power (EP)	.21	.18		.88	.31	.31	.29	.30	.19	.29	.28	-.03	-.08	-.18	.32	.18
Referent Power (RP)	.31	.23	.47		.27	.42	.25	.27	.25	.28	.06	-.20	-.18	-.30	.16	.16
Purpose (P)	.16	.17	.32	.38		.37	.19	.28	.17	.20	-.02	-.28	-.28	-.34	.17	.07
Leader Support (LSp)	.32	.29	.44	.49	.50		.55	.58	.34	.37	.13	-.31	-.37	-.39	.21	.07
Leader Structure (LSr)	.24	.31	.37	.29	.33	.59		.88	.40	.32	.15	-.20	-.38	-.17	.08	.03
Role Clarity (RCI)	.30	.39	.41	.27	.36	.58	.78		.26	.36	.24	-.21	-.29	-.29	.21	.14
Autonomy (A)	.15	.15	.14	.24	.37	.42	.40	.26		.58	.07	-.44	-.54	-.30	-.02	-.28
Challenge-Skill (CS)	.21	.30	.28	.37	.32	.38	.36	.27	.53		.25	-.15	-.20	-.21	.18	.08
Challenge-Effort (CE)	.08	-.01	.08	.06	-.08	-.08	.06	.09	-.12	.03		.27	.08	.08	.37	.32
Overload (O)	-.23	-.23	-.20	-.23	-.46	-.43	-.27	-.23	-.54	-.22	.28		.80	.81	.27	.36
Punishment Behavior (PB)	-.21	-.28	-.07	-.18	-.38	-.34	-.31	-.21	-.51	-.32	.27	.56		.44	.38	.44
Role Conflict (RCf)	-.20	-.17	-.20	-.32	-.47	-.47	-.23	-.25	-.40	-.18	.20	.85	.42		.03	.08
Performance Goals (PG)	.04	.04	.11	.17	.02	.10	.15	.27	-.08	.07	.29	.10	.25	-.04		.54
Rules Emphasis (RE)	-.02	-.03	.12	.07	-.06	.03	.09	.18	-.25	-.13	.38	.30	.47	.11	.39	

NOTE: Correlations for Sample 1 are given in the lower triangle with Sample 2 in the upper triangle. Correlations significantly different ( $p < .05$ ) for the two samples are underlined. Sample sizes for the correlations were between 197 and 213.

Two-tailed Test  
 $p = .05, r = .14$   
 $p = .01, r = .18$   
 $p = .001, r = .25$

FIGURE 1  
SUMMARY OF FACTORS FOR INITIAL AND REVISED QUESTIONNAIRES

INITIAL QUESTIONNAIRE	FACTOR 1 "LEADER ADMINISTRATION/SUPPORT" Leader Support (.73/.82) Expert Power (.88/.94) Referent Power (.71/.84) *D. I. Equity (.82/.84) *Reward Power (.88/.92)		FACTOR 2 "DISCIPLINE/CONTROL PRESSURE" Overload (.87/.89) Punishment Behavior (.76/.78) Performance Goals (.81/.84) Role Conflict (.38/.44) *Legitimate Power (.51/.48) *Surveillance (.88/.74)		FACTOR 3 "LEADER STRUCTURE" Role Clarity (.71/.78) Leader Structure (.82/.81) Leader Support (.32/.46) *Feedback (.88/.73) *D. I. Equity (.43/.48) *Reward Power (.34/.81)		FACTOR 4 "GROUP COHESIVENESS" Group Support (.78/.81) Group Teamwork (.72/.81)					
REVISED QUESTIONNAIRE 1 - FACTOR SOLUTION	FACTOR 1 Leader Support (.82/.88) Expert Power (.84/.88) Referent Power (.88/.88) Role Conflict (-.57/-53) Overload (-.82/-88) Punishment Behavior (-.38/-38) *Purpose (.88/.88) *Autonomy (.88/.88)		FACTOR 2 Overload (.88/.81) Punishment Behavior (.84/.88) Performance Goals (.88/.78) *Rules Emphasis (.71/.78) *Challenge-Effort (.47/.48) *Autonomy (-.38/-38)		FACTOR 3 Role Clarity (.71/.71) Leader Structure (.88/.82) Leader Support (.88/.88) *Challenge-Skill (.51/.58) *Autonomy (.38/.38)		FACTOR 4 Group Support (.78/.82) Group Teamwork (.78/.88)					
REVISED QUESTIONNAIRE 2 - FACTOR SOLUTION	FACTOR 1-A Leader Support (-.38/-48) Role Clarity (.78/.78) Overload (.78/.71) Punishment Behavior (.38/.48) *Purpose (-.48/-48)		FACTOR 1-B Expert Power (.88/.78) Referent Power (.88/.88)		FACTOR 2 Overload (.81/.48) Punishment Behavior (.88/.88) Performance Goals (.88/.78) *Rules Emphasis (.71/.74) *Challenge-Effort (.88/.48)		FACTOR 3-A Role Clarity (.88/.78) Leader Structure (.88/.81) Leader Support (.48/.88)		FACTOR 3-B *Challenge-Skill (.78/.88) *Autonomy (.84/.88)		FACTOR 4 Group Support (.71/.87) Group Teamwork (.88/.88)	

\*Scale included in analysis for only one version of the questionnaire.

NOTE: Only those scales which had factor loadings of at least .30 in both samples are shown. Orthogonal factor loadings are given in parenthesis (Sample 1 / Sample 2).

## DISCUSSION

Scale revisions met the objective of increased internal consistency for five of seven initially marginal scales. The internal consistency for "Autonomy" continued to be too low for other than exploratory purposes. The remaining scale, "Challenge," appeared to combine two distinct concepts. Separate scales for the effort required to meet training demands and for use and development of skills and abilities are evidently justifiable. In this study, each of the proposed "subscales" contained only two items and had low internal consistency. Lengthier scales with higher internal consistencies are needed because recruit interviews emphasized successful coping with both types of challenge as a source of positive feelings at the end of training. The seven other scales from the initial questionnaire again demonstrated acceptable internal consistency. The new Purpose scale had marginal internal consistency and will require further development for use in the future.

Factor analysis results provided additional insight into the minimum number of psychological facets of basic training to consider in future studies. The findings supported the basic stability of the 4-factor solution obtained with the initial questionnaire, but suggested that significant details of training might be obscured if additional factors were not considered. In the present study the initial solution was largely reproduced when only four factors were rotated. The major difference between the present 4-factor solution and the initial questionnaire findings is the loadings for Overload, Role Conflict, and Punishment Behavior on the "Leader Admiration/Support" factor. The increased internal consistency for these variables may explain the emergence of these loadings.

One additional factor was defined by the Challenge-Skill and Autonomy scales. Both had marginal internal consistencies in this questionnaire and neither was present in the initial questionnaire.

A second new factor split Expert Power and Referent Power from the initial "Leader Admiration/Support" factor. Results from the initial questionnaire showed no tendency for such a split, but these scales did have high "specific factor" loadings (i.e., low communalities relative to their reliability, cf., Gorsuch, 1974). In the present questionnaire, these scales also had low communalities relative to their internal consistency until the sixth factor was added (see Appendix D).

An economical interpretation of the findings from the two questionnaires can be achieved in terms of "higher order" and "lower order" factors. Higher order factors represent very general domains of interrelated phenomena. Lower order factors reflect more specific subdomains within the general domain. The data from the two questionnaire studies suggest that a minimum of four general domains are important to perceptions of Marine Corps basic training. These are: (a) Discipline-Job Pressure reflecting the role demands on the recruit, (b) Leader Admiration/Support reflecting the role model characteristics of the Drill Instructors, (c) Leader structuring and the clarity of role expectations, and (d) Group teamwork and support. Leader Admiration/Support and Leader Structure have distinct subdomains which should also be considered.

The results have useful implications for future efforts. Although the general domains are currently more firmly established, adequate coverage of the subdomains identified in this study is needed to ensure a complete and reasonably detailed picture of the basic training experience. In addition, composite factor scales may be used to reduce the total number of variables to be included in future studies. Finally, despite the many unique aspects of Marine Corps basic training, the four general factors identified as necessary to describe it are very similar to those found for other organizational settings. This suggests that the hypotheses developed in general organizational research can guide our further research on stress effects in Marine Corps basic training.

# REFERENCES

- Aronson, E. & Mills, J. The effect of severity of initiation on liking for a group. Journal of Abnormal and Social Psychology, 1959, 59, 177-181.
- Biersner, R.J., La Rocco, J.M., & Ryman, D.H. Mood scales as predictors of discharge and sick call visits during basic military training. Military Medicine, 1976, 141, 859-861.
- Booth, R.F. & Hoiberg, A. Change in Marine recruits' attitudes related to recruit characteristics and Drill Instructors' attitudes. Psychological Reports, 1973, 33, 63-71.
- Bourne, P.G. Some observations on the psychosocial phenomena seen in basic training. Psychiatry, 1967, 30, 187-196.
- Brotz, H. & Wilson, E. Characteristics of military society. American Journal of Sociology, 1946, 51, 372-374.
- Datel, W.E., Engle, E.O., & Barba, M.A. Affect levels in a company of basic trainees. Psychological Reports, 1966, 19, 903-909.
- Faris, J.H. Changing patterns of socialization in U.S. Army basic combat training. Chicago: University of Chicago, Technical Report, 1973.
- Gorsuch, R.L. Factor Analysis. Philadelphia: Saunders, 1974.
- Janis, I.L. Psychodynamic aspects of adjustment to Army life. Psychiatry, 1945, 8, 159-176.
- Maskin, M.H. & Altman, L.L. Military psychodynamics: Psychosocial factors in the transition from civilian to soldier. Psychiatry, 1943, 6, 263-269.
- Mobley, W.H., Hand, H.H., Baker, R.L., & Meglino, B.M. An analysis of recruit training attrition in the U.S. Marine Corps. Columbia, SC: Center for Management and Organizational Research, Technical Report No. 5, 1978.
- Nie, H.H., Hull, C.H., Jenkins, J.G., Steinbrenner, K., & Bent, D.H. SPSS: Statistical Package for the Social Sciences. New York: McGraw-Hill, Inc., 1975.
- Nunnally, J.C. Psychometric Theory. New York: McGraw-Hill, Inc., 1967.
- Vickers, R.R., Jr. & Ryman, D.H. Development of a questionnaire to measure stress and related concepts in the context of the Marine Corps basic training setting. San Diego, CA: Naval Health Research Center, Technical Report No. 80-12, 1980.
- Zurcher, L.A., Jr. The Naval Recruit Training Center: A study of role assimilation in a total institution. Sociological Inquiry, 1967, 37, 85-98.

APPENDIX A  
ITEM CONTENT OF SCALES

This appendix provides the item content for the scales used in the revised questionnaire. Their order of presentation is reflected in the questionnaire item number.

As discussed in the main text, two different sets of response options were used for this questionnaire. Those items or scales which were answered using the frequency response set are indicated with an asterisk (\*). The agreement response set was used with the remaining items.

Analysis of the internal consistencies for these scales resulted in several items being excluded from the final set used in the factor analyses. These deleted items are indicated by a parenthesis around the questionnaire item number. The internal consistencies for the initial and final set of items are given in Table A-1 at the end of this Appendix.

Questionnaire

<u>Item Number</u>	<u>Referent Power</u>
3	I would like to be like my DIs.
5	I admire my DIs.
8	I respect my DIs as people.
14	My DIs are good examples of what Marines should be.

Expert Power

1	My DIs are well-qualified for their jobs.
6	My DIs are very skilled Marines.
11	My DIs are very experienced Marines.
16	My DIs really know their stuff.
18	My DIs are very good at what they do.

Group Support

2	Recruits in the platoon trust one another.
4	Recruits in the platoon lent each other a hand when things got rough
7	Recruits in the platoon got along well together.
9	In this platoon, people pretty much looked out for their own interests.
38*	Recruits in this platoon helped each other out during tough times.

Group Teamwork

12	Recruits willingly did their jobs when there was a group task to be done.
13	In our platoon people cooperated to get things done.
22*	In this platoon groups worked together well to get things done.
25*	Recruits stressed teamwork and team goals.

Questionnaire

Item Number

Purpose

- (10) The reason for DIs' toughness and harshness was to develop mental and physical conditioning in the recruits.
- 15 Trashing and Rack Drills have a real purpose in Marine Recruit training.
- (17) Boot camp finds out which recruits can stand up to stress.
- 20\* Pit calls were used for punishment and harassment.
- (19) Boot camp determines which recruits will not stand up to combat.
- 29\* DIs were more interested in punishing and embarrassing recruits than in teaching discipline.

Leader Structure\*

- 21 Our DIs told us exactly how to do things.
- 26 The DIs let us know exactly what was expected of us.
- 30 Our DIs kept the platoon well informed.
- 36 The DIs explained in detail what to do.
- 33 DIs told us why things had to be done.

Leader Support\*

- 23 DIs listened to recruits' problems when a difficulty arose.
- 27 The DIs were interested in our welfare.
- 31 The DIs were proud of the platoon.
- 35 DIs cared about the platoon and the recruits in it.

Role Clarity\*

- 24 Orders and explanations were clear about what had to be done.
- 28 Recruits' responsibilities were clearly defined.
- 32 Recruits knew exactly what was expected of them.
- 34 We knew what we were supposed to accomplish in recruit training.
- 37 Rules and decisions were clearly explained.

Overload/Job Pressure\*

- 41,75,109 We had to work on rush jobs and work very fast.
- 54,88,122 There were tight schedules with pressure to get things done on time.
- 58,92,126 It was impossible to complete a job in the time given.
- 69,103,137 There were so many assignments that there was more to do no matter how much got done.
- 70,104,138 There was too much pressure on us.

Role Conflict\*

- 40,74,108 I had to do things which should have been done differently.
- 46,80,114 I had to work under conflicting policies and regulations.
- 53,87,121 I received conflicting orders about what to do from different DIs.
- 57,91,125 I had to do things in a way that was acceptable to one DI but not another.

Questionnaire

Item Number

Challenge/Utilization of Skills and Abilities\*

- 43,77,111<sup>b</sup> There was a chance to show your best abilities.  
 (50,84,118) Training was dull and boring.  
 56,90,124<sup>a</sup> Training required skill and effort to do well.  
 59,93,127<sup>a</sup> Training was very physically demanding.  
 63,97,131<sup>b</sup> I had opportunities to use my own judgment.

Rules Emphasis/Standardization\*

- 51,85,119 There was a strict emphasis on following the rules and regulations.  
 44,78,112 My DIs were very strict about the rules.  
 64,98,132 Even minor rules and regulations were very strictly enforced.  
 68,102,136 Recruits who broke minor rules were punished for it.  
 (71,105,139) There was only one way to do a thing.

Autonomy\*

- 45,79,113 There was a lack of personal freedom.  
 48,82,116 Recruits had control of their own activities.  
 52,86,120 Recruits were given some responsibility.  
 65,99,133 Recruits were treated like children.  
 (57,101,135) I was treated as an individual.

Punishment Behavior\*

- 42,76,110 DIs criticized poor work.  
 49,83,117 DIs rode any recruit who made a mistake.  
 55,89,123 DIs criticized and embarrassed recruits in front of others.  
 60,94,128 DIs were very quick to criticize poor performance.  
 62,96,130 DIs used threats and fear of punishment to motivate us.

Performance Goals\*

- 39,73,107 DIs insisted on high standards of performance.  
 47,81,115 DIs stressed the importance of achieving series honor, and awards.  
 61,95,129 The DIs wanted you to do more than just pass an exam or prac.  
 66,100,134 We were expected to be getting better and better at what we did.  
 72,106,140 Our DIs stressed doing better than the other platoons.

<sup>a</sup>Challenge-Skill subscale

<sup>b</sup>Challenge-Effort subscale

**TABLE A-1**  
**INTERNAL CONSISTENCIES**  
**FOR INITIAL AND FINAL SET OF ITEMS**  
**FOR REVISED QUESTIONNAIRE**

	PHASE <sup>a</sup>	INITIAL SET		FINAL SET	
		SAMPLES		SAMPLES	
		1	2	1	2
<b>ROLE DEMANDS</b>					
Role Clarity		.73	.72	No Change	
Role Conflict	1	.74	.80	No Change	
	2	.79	.75	No Change	
	3	.78	.78	No Change	
Challenge	1	.19	.47	.49	.27 <sup>b</sup>
	2	.35	.46	.31	.46
	3	.46	.54	.46	.46
	1	---	---	.33	.54 <sup>c</sup>
	2	---	---	.51	.44
	3	---	---	.44	.51
Overload	1	.70	.67	No Change	
	2	.75	.69	No Change	
	3	.81	.73	No Change	
<b>INTERPERSONAL PROCESSES</b>					
Leader Support		.73	.72	No Change	
Leader Structure		.70	.81	No Change	
Group Support		.73	.70	No Change	
Group Teamwork		.82	.81	No Change	
Purpose		.51	.49	No Change	
<b>DISCIPLINARY STYLE/MODES OF SOCIAL INFLUENCE</b>					
Autonomy	1	.57	.57	.61	.55
	2	.43	.52	.50	.55
	3	.45	.51	.51	.50
Rules Emphasis	1	.55	.54	.57	.50
	2	.68	.65	.71	.70
	3	.72	.67	.78	.74
Punishment Behavior	1	.70	.69	No Change	
	2	.75	.73	No Change	
	3	.74	.75	No Change	
Expert Power		.76	.86	No Change	
Performance Goals	1	.48	.48	No Change	
	2	.60	.68	No Change	
	3	.61	.68	No Change	
Referent Power		.84	.61	No Change	

<sup>a</sup>Scales for which no Phase is given were asked over the entire training period.

<sup>b</sup>Challenge-Effort Scale (Subset of original Challenge Scale).

<sup>c</sup>Challenge-Skill Scale (Subset of original Challenge Scale).

APPENDIX B

TABLE B-1

PEARSON CORRELATIONS ACROSS PHASES  
FOR PHASE SPECIFIC STRESS SCALES

PHASE SCORES CORRELATED:	PHASE COMPARISONS					
	1 vs. 2		2 vs. 3		1 vs. 3	
	SAMPLE		SAMPLE		SAMPLE	
	1	2	1	2	1	2
<b>ROLE DEMANDS</b>						
Role Conflict	.78	.86	.78	.71	.67	.66
Overload	.70	.70	.63	.59	.50	.52
Challenge-Effort	.52	.49	.55	.48	.47	.50
Challenge-Ability	.51	.44	.67	.58	.38	.37
<b>DISCIPLINARY STYLE/MODES OF SOCIAL INFLUENCE</b>						
Autonomy	.51	.42	.47	.45	.28	.31
Rules Emphasis	.61	.51	.65	.69	.36	.37
Punishment Behavior	.78	.74	.77	.80	.63	.63
Performance Goals	.66	.66	.43	.66	.30	.54

# APPENDIX C

## TABLE C-1

COEFFICIENTS OF CONGRUENCE  
BETWEEN SAMPLES FOR 4, 5, AND 6 FACTOR ORTHOGONAL SOLUTIONS

	FACTOR:	1	2	3	4	5	6
FOUR FACTOR SAMPLE 2							
SAMPLE 1	1	-.21	.98*	.88	.45		
	2	-.01	.80	.98*	.51		
	3	.97*	-.18	-.05	.03		
	4	.03	.44	.50	.96*		
FIVE FACTOR SAMPLE 2							
SAMPLE 1	1	-.08	.99*	.80	.57	.34	
	2	.94*	-.25	.03	-.30	.09	
	3	.13	.57	.98*	.53	.40	
	4	.13	.44	.49	.39	.94*	
	5	.06	.55	.55	.89*	.39	
SIX FACTOR SAMPLE 2							
SAMPLE 1	1	.33	-.47	.98*	-.52	-.24	-.39
	2	.10	.98*	-.48	.49	.41	.49
	3	.97*	.08	.33	-.20	.10	.25
	4	.22	.59	-.59	.42	.45	.91*
	5	.05	.48	-.33	.38	.95*	.39
	6	-.20	.53	-.52	.95*	.34	.41

\*Corresponding Factors in the Two Subsamples.

APPENDIX D  
RESULTS OF THE ORTHOGONAL FACTOR ANALYSIS

TABLE D-1  
FOUR-FACTOR ORTHOGONAL SOLUTION  
FOR REVISED QUESTIONNAIRE

	FACTOR 1		FACTOR 2		FACTOR 3		FACTOR 4	
	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2
Referent Power	.58	.60	.18	.21	.12	.13	.23	.20
Expert Power	.44	.48	.24	.33	.25	.21	.14	.17
Group Support	.20	.12	.01	.07	.08	.13	.75	.83
Group Teamwork	.11	.11	-.05	.08	.22	.19	.78	.86
Purpose	.83	.49	-.09	.01	.21	.15	.05	.10
Leader Structure	.25	.13	.08	-.01	.88	.83	.13	.11
Leader Support	.63	.46	.02	.02	.45	.53	.18	.24
Role Clarity	.30	.26	.21	.11	.71	.71	.24	.18
Overload	-.82	-.56	.46	.81	-.13	-.14	-.10	.04
Role Conflict	-.87	-.63	.23	.27	-.07	-.15	-.07	.01
Challenge-Effort	-.09	-.02	.47	.40	.05	.25	.05	.17
Challenge-Skill	.34	.28	-.11	.04	.31	.36	.20	.32
Rules Emphasis	-.01	.08	.71	.70	.05	.03	-.03	.02
Autonomy	.45	.32	-.39	-.33	.35	.39	.04	.27
Punishment Behavior	-.36	-.35	.84	.83	-.28	-.38	-.17	-.07
Performance Goals	.11	.27	.48	.73	.12	.07	.02	.08

\*Scales with factor loadings of at least .30 in both samples.

NOTE: All factors in these tables are numbered according to the convention established in Figure 1 of this report.

TABLE D-2  
FIVE-FACTOR ORTHOGONAL SOLUTION  
FOR REVISED QUESTIONNAIRE

	FACTOR 1		FACTOR 2		FACTOR 3-A		FACTOR 3-B		FACTOR 4	
	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2
Referent Power	.51	.54	.23	.33	.05	.08	.35	.22	.23	.12
Expert Power	.39	.40	.26	.44	.23	.15	.21	.24	.14	.06
Group Support	.18	.11	.01	.06	.08	.11	.08	.03	.75	.82
Group Teamwork	.08	.10	-.06	.15	.22	.20	.10	.24	.78	.82
Purpose	.59	.50	-.07	.07	.20	.15	.22	.04	.05	.13
Leader Structure	.23	.14	.06	.02	.81	.77	.23	.24	.14	.08
Leader Support	.60	.46	.04	.09	.43	.52	.22	.17	.19	.24
Role Clarity	.26	.25	.19	.14	.81	.78	.07	.09	.24	.18
Overload	-.86	-.84	.47	.52	-.16	-.11	-.04	-.16	-.12	.03
Role Conflict	-.73	-.66	.22	.18	-.11	-.14	.01	-.10	-.09	-.01
Challenge-Effort	-.13	-.12	.46	.43	.03	.19	.08	.18	.04	.13
Challenge-Skill	.18	.17	-.06	.16	.17	.23	.76	.88	.16	.19
Rules Emphasis	-.00	-.01	.70	.86	.10	.08	-.14	-.19	-.02	.08
Autonomy	.36	.22	-.37	-.22	.27	.18	.47	.87	.01	.10
Punishment Behavior	-.34	-.40	.81	.84	-.22	-.32	-.24	-.32	-.17	-.03
Performance Goals	.08	.14	.48	.78	.14	.04	.01	.07	.02	.05

\*Scales with factor loadings of at least .30 in both samples.

NOTE: All factors in these tables are numbered according to the convention established in Figure 1 of this report.

**TABLE D-3**  
**SIX-FACTOR ORTHOGONAL SOLUTION**  
**FOR REVISED QUESTIONNAIRE**

	FACTOR 1-A		FACTOR 1-B		FACTOR 2		FACTOR 3-A		FACTOR 3-B		FACTOR 4	
	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2
Referent Power	-.19	-.28	.89 *	.86	.11	.12	.05	.11	.20	.11	.18	.14
Expert Power	-.09	-.09	.58 *	.73	.11	.20	.27	.18	.05	.13	.09	.06
Group Support	-.17	-.13	.19	.00	.01	.11	.09	.10	.07	.07	.71 *	.87
Group Teamwork	-.07	.03	.07	.24	-.02	.04	.20	.21	.11	.19	.82 *	.86
Purpose	-.45 *	-.42	.37	.24	-.05	.06	.21	.16	.20	.03	.04	.13
Leader Structure	-.13	-.07	.20	.15	.06	-.04	.80 *	.81	.24	.20	.13	.08
Leader Support	-.39 *	-.40	.48	.23	-.00	.09	.46 *	.52	.17	.16	.16	.25
Role Clarity	-.17	-.24	.19	.11	.20	.17	.80 *	.75	.08	.12	.24	.19
Overload	.73 *	.71	-.11	-.03	.31 *	.43	-.15	-.10	-.17	-.18	-.13	.02
Role Conflict	.79 *	.73	-.19	-.12	.07	.09	-.08	-.11	-.08	-.12	-.09	-.01
Challenge-Effort	.20	.15	.03	.07	.50 *	.42	.01	.18	.07	.20	.04	.11
Challenge-Skill	-.06	-.14	.27	.15	-.01	.16	.14	.21	.70 *	.59	.17	.19
Rules Emphasis	.09	.03	.07	.07	.71 *	.74	.10	.06	-.19	-.15	-.03	.07
Autonomy	-.41	-.22	.06	.12	-.20	-.23	.22	.18	.64 *	.86	.02	.10
Punishment Behavior	.39 *	.42	-.06	-.06	.52 *	.53	-.20	-.31	-.33	-.29	-.18	-.04
Performance Goals	-.04	-.00	.07	.32	.56 *	.72	.12	.04	.01	.07	.02	.04

\*Scales with factor loadings of at least .30 in both samples.

NOTE: All factors in these tables are numbered according to the convention established in Figure 1 of this report.

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 82-19	2. GOVT ACCESSION NO. AD-A123 134	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  Revision of a Questionnaire to Measure Stress and Related Aspects of Basic Training		5. TYPE OF REPORT & PERIOD COVERED  Interim
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)  Marie T. Wallick, Ross R. Vickers, Jr., David H. Ryman		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS  Naval Health Research Center P.O. Box 85122 San Diego, CA 92138		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS  M0096-PN.001-1035
11. CONTROLLING OFFICE NAME AND ADDRESS  Naval Medical Research & Development Command Department of the Navy Bethesda, MD 20814		12. REPORT DATE June 1982
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)  Bureau of Medicine and Surgery Department of the Navy Washington, DC 20372		13. NUMBER OF PAGES 17
		15. SECURITY CLASS. (of this report)  Unclassified
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  Group dynamics Psychological stress Leadership Recruits Social power		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  An initial questionnaire, developed to provide situation-specific measures of stress and related factors in Marine Corps basic training, identified four factors as defining the major domains of recruits' perceptions of training. Since several scales with lower internal consistency than desired were excluded from the analysis, the number of basic factors required to understand stress effects in training might have been underestimated. A revised questionnaire was administered to a random sample of 425 recruits		

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S/N 0102-LF 014-6601

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20. Abstract (continued)

graduating in February and March, 1980. Five of seven revised scales showed acceptable internal consistency. Factor analysis indicated that the original four factors were reproducible. Two further factors were identified which resulted from the splitting of two of the original factors.

Four general factors describe the key psychological facets of basic training: (a) Discipline-Job Pressure reflecting role demands on recruits, (b) Leader Admiration/Support reflecting Drill Instructor role model characteristics, (c) Leader structuring and clarity of role expectations, and (d) Group teamwork and support. Leader Admiration/Support and Leader Structure have distinct subdomains that should be considered to obtain a detailed picture of training experience and stress effects.

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